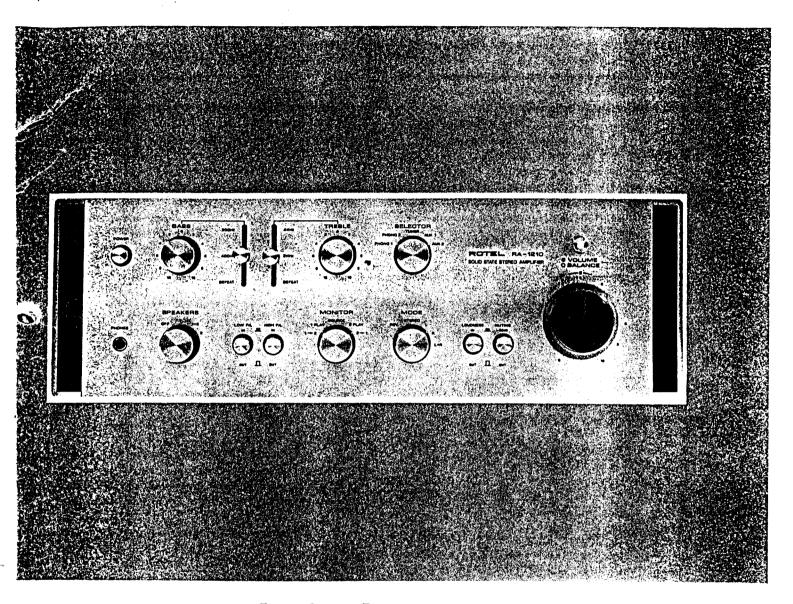


RA-1210

STEREO PRE-MAIN AMPLIFIER



technical manual

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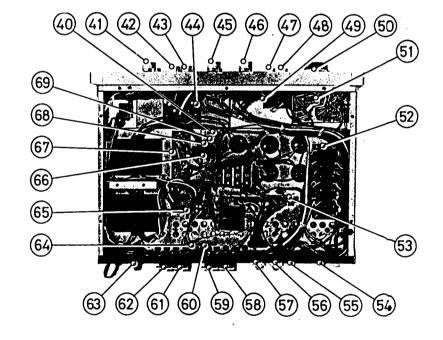
| CHASSIS LAYOUT | 2 | PRE-AMPLIFIER CIRCUIT BOARD DIAGRAM | 7 |
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CHASSIS LAYOUT

- 1. C003, Ripple Filter
- 2. C006, Ripple Filter
- 3. Volume Control
- 4. F003, DC Fuse, +B, R-ch.
- 5. Function Selector
- 6. C007, Ripple Filter
- 7. Treble Control
- 8. Switch, Treble Turn-over, Roll-off
- 9. Switch, Bass Turn-over, Roll-off
- 10. Bass Control
- 11. Switch, Power Supply
- 12. D903, Rectifier
- 13. D905, Rectifier
- 14. F001, DC Fuse, +B L-ch.
- 15. F002, DC Fuse, -B, L-ch.
- 16. T001, Power Transformer
- 17. D906, Rectifier
- 18. D904, Rectifier
- 19. Voltage Selector
- 20. T002, Power Transformer
- 21. J001, AC Outlet
- 22. RY901, Delay Relay
- 23. Q003, Power Transistor, R-ch.
- 24. F004, DC Fuse, -B, R-ch.
- 25. Q612, Driver Transistor, R-ch.
- 26. Terminal, Tape Monitor
- 27. Q004, Power Transistor, R-ch.
- 28. VR602, Idling Current Adj., R-ch.
- 29. Q611, Driver Transistor, R-ch.
- 30. Q002, Power Transistor, L-ch.
- 31. Terminal, Phono, Aux Input
- 32. Q605, Driver Transistor, L-ch.
- 33. Q001, Power Transistor, L-ch.
- 34. Q606, Driver Transistor, L-ch.
- 35. VR601, Idling Current Adj., L-ch.
- 36. Main Amp. Circuit Board
- 37. Equalizer Amp. Circuit Board
- 38. C004, Ripple Filter
- 39. C005, Ripple Filter
- 40. Stabilizer Circuit Board
- 41. Speakers Selector
- 42. Switch, Low Filter
- 43. Switch, High Filter
- 44. Filter Switch Circuit Board
- 45. Switch, Monitor
- 46. Switch, Mode
- 47. Switch, Loudness
- 48. Switch, Muting
- 49. Loudness Switch Circuit Board
- 50. Balance Control
- 51. Volume Control
- 52. Aux Input Circuit Board
- 53. Bracket, Main Amp. Circuit Board
- 54. Switch, Phono Input Impedance
- 55. Switch, Phono Input Sensitibity

1 2 3 4 5 6 7 8 9 10 11 12 39 38 38 36 35 36 37 36 37 39 30 31 30 29 28 27 26 25 24 23 22 21



- 56. Terminal, Pre OUT, Main IN, R-ch.
- 57. Terminal, Pre OUT, Main IN, L-ch.
- 58. Terminal, Speaker-1, R-ch.
- 59. Terminal, Speaker-2, R-ch.
- 60. Circuit Breaker, R-ch.
- 61. Terminal, Speaker-1, L-ch.
- 62. Terminal, Speaker-2, L-ch.

- 63. F005, AC Fuse
- 64. Circuit Breaker, L-ch.
- 65. Relay Circuit Board
- 66. D902, Zener Diode
- 67. Rectifier Circuit Board68. Q901, Stabilizer Transistor
- 69. D901, Rectifier

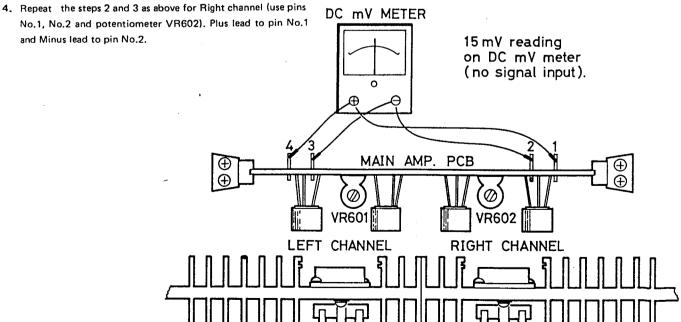
PRECAUTIONS

- Always disconnect the chassis from power line when soldering.
 Turning the power switch OFF is not enough. Power line leakage passing through the heating element may destroy the transistors.
- Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.
- 3. Replacement for output and driver transistors, if necessary, must be made from the same beta group as the original type.
- 4. If one output transistor burns out (open or short) always remove all output transistors in that channel and check the bias
- adjustment, the control and other parts in the network with an ohm-meter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing circuit is open on the emitter end.
- When mounting a replacement power transistor, be sure the bottom of the flange, the mica insulators and the surface of the heat sink are free of foreign matter, for they may cause transistors failure.
- Silicon grease must be applied between the transistor and the mica insulator, and between the mica insulator and the heat sink for better heat conduction.

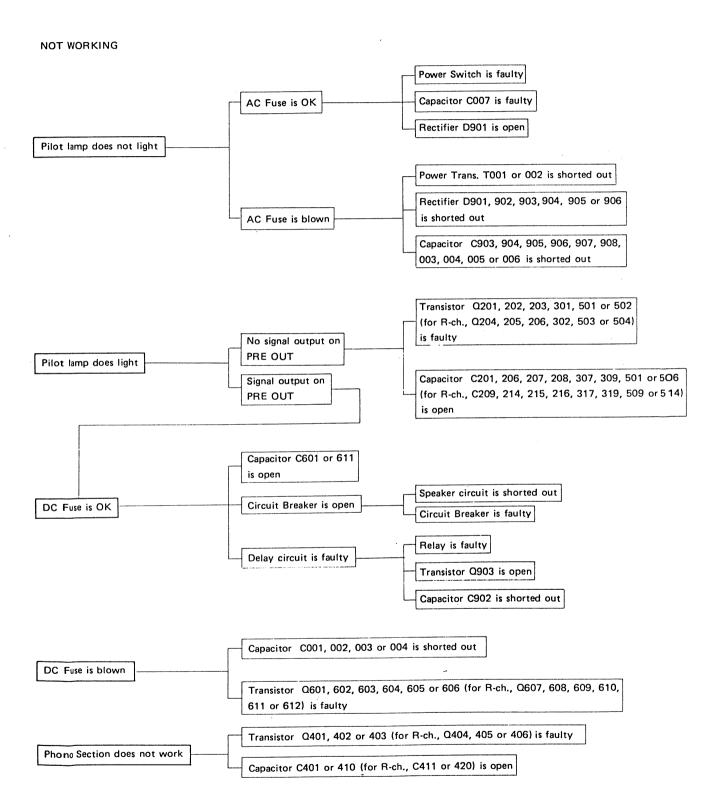
BIAS (IDLING CURRENT) ADJUSTMENT

Adjust Idling Current using a DC milli-volt meter.

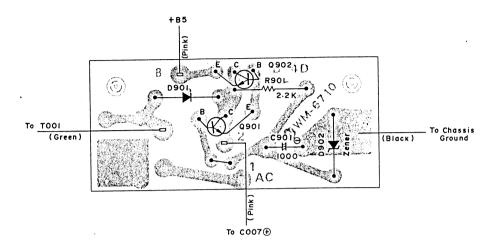
- 1. Set Volume Control to minimum position = no signal input.
- Connect the plus lead of a DC mV meter to pin No.4 (on Main Amp. PCB) and the minus lead of a DC mV meter to pin No.3 (see below).
- Rotate VR601 potentiometer (on Main Amp. PCB) to obtain a 15mV reading on DC mV meter.



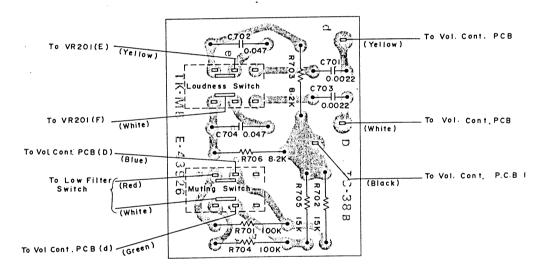
TROUBLE SHOOTING



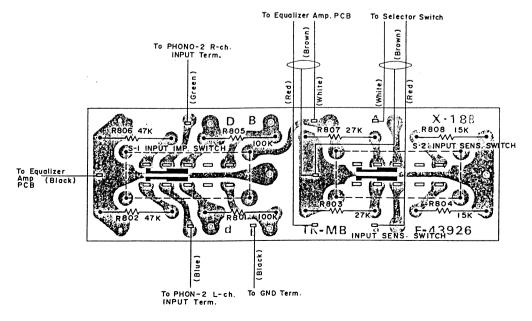
STABILIZER CIRCUIT BOARD DIAGRAM



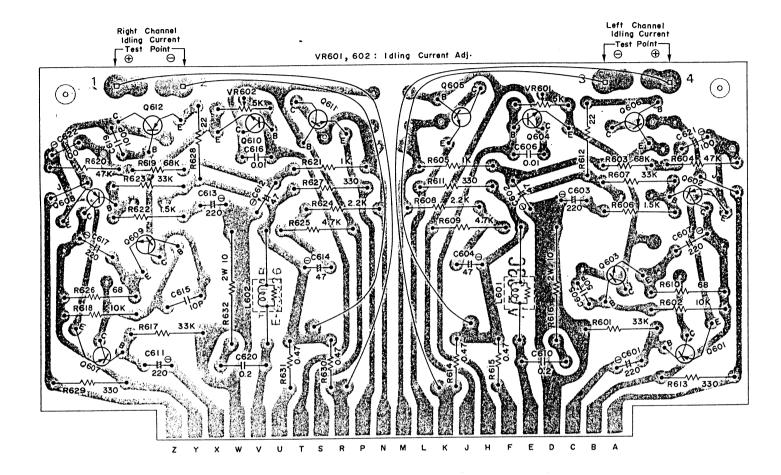
LOUDNESS AND MUTING CIRCUIT BOARD DIAGRAM



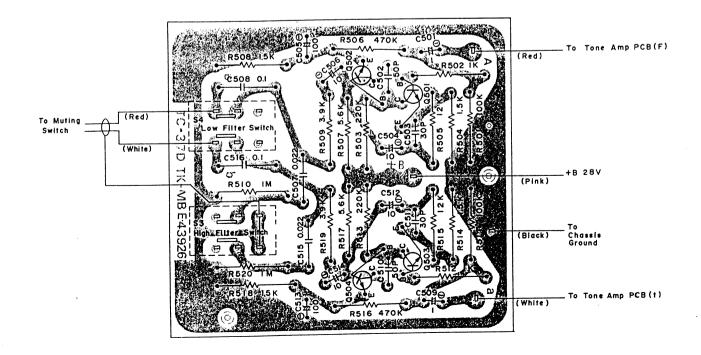
PHONO INPUT CIRCUIT BOARD DIAGRAM



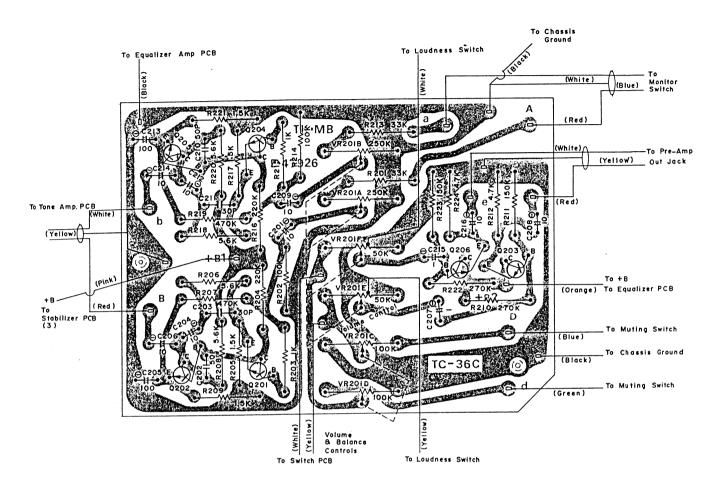
MAIN AMPLIFIER CIRCUIT BOARD DIAGRAM



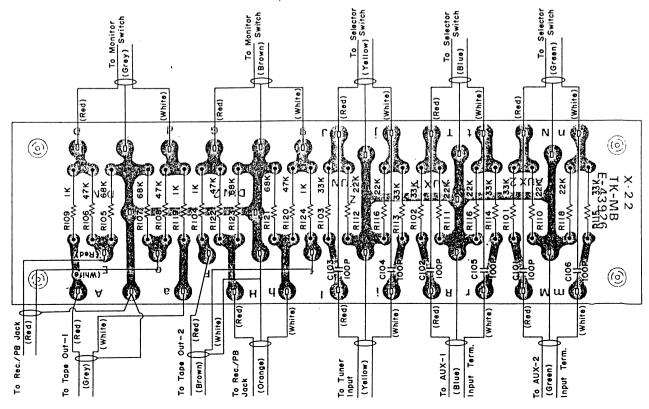
FILTER CIRCUIT BOARD DIAGRAM



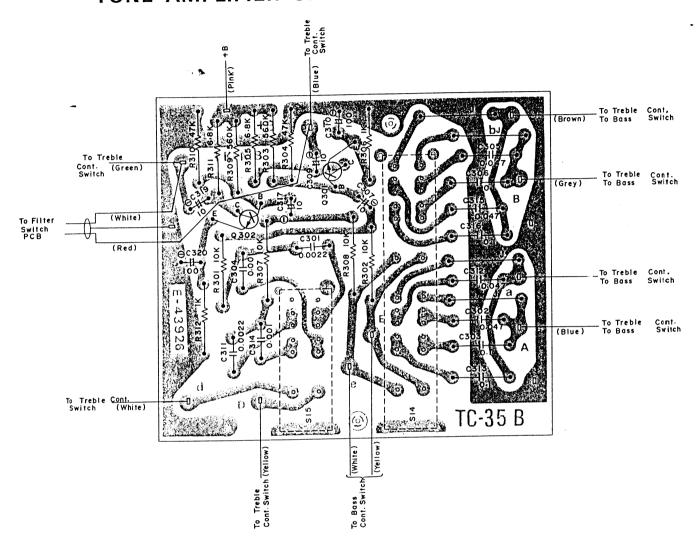
PRE-AMPLIFIER CIRCUIT BOARD DIAGRAM



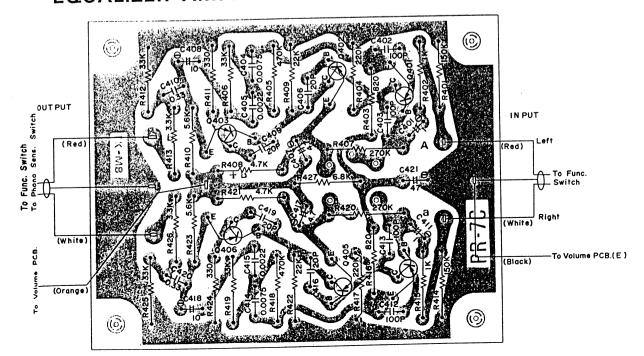
AUXILIARY INPUT CIRCUIT BOARD DIAGRAM



TONE AMPLIFIER CIRCUIT BOARD DIAGRAM

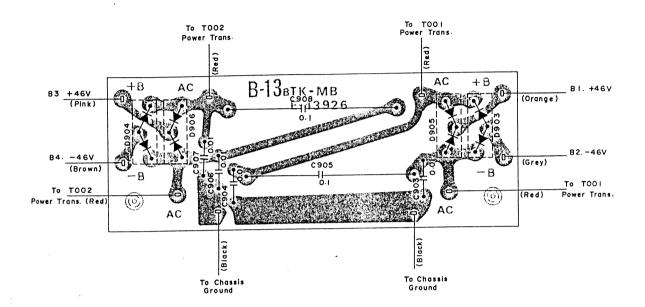


EQUALIZER AMPLIFIER CIRCUIT BOARD DIAGRAM

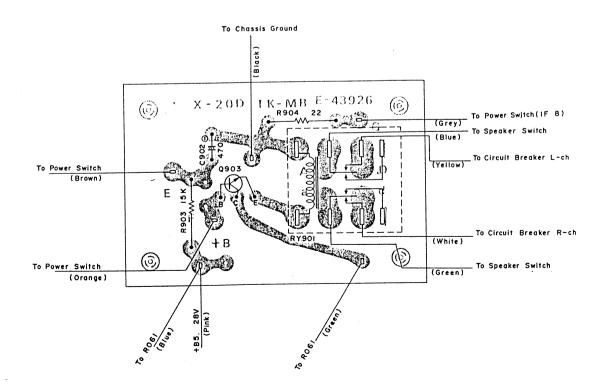


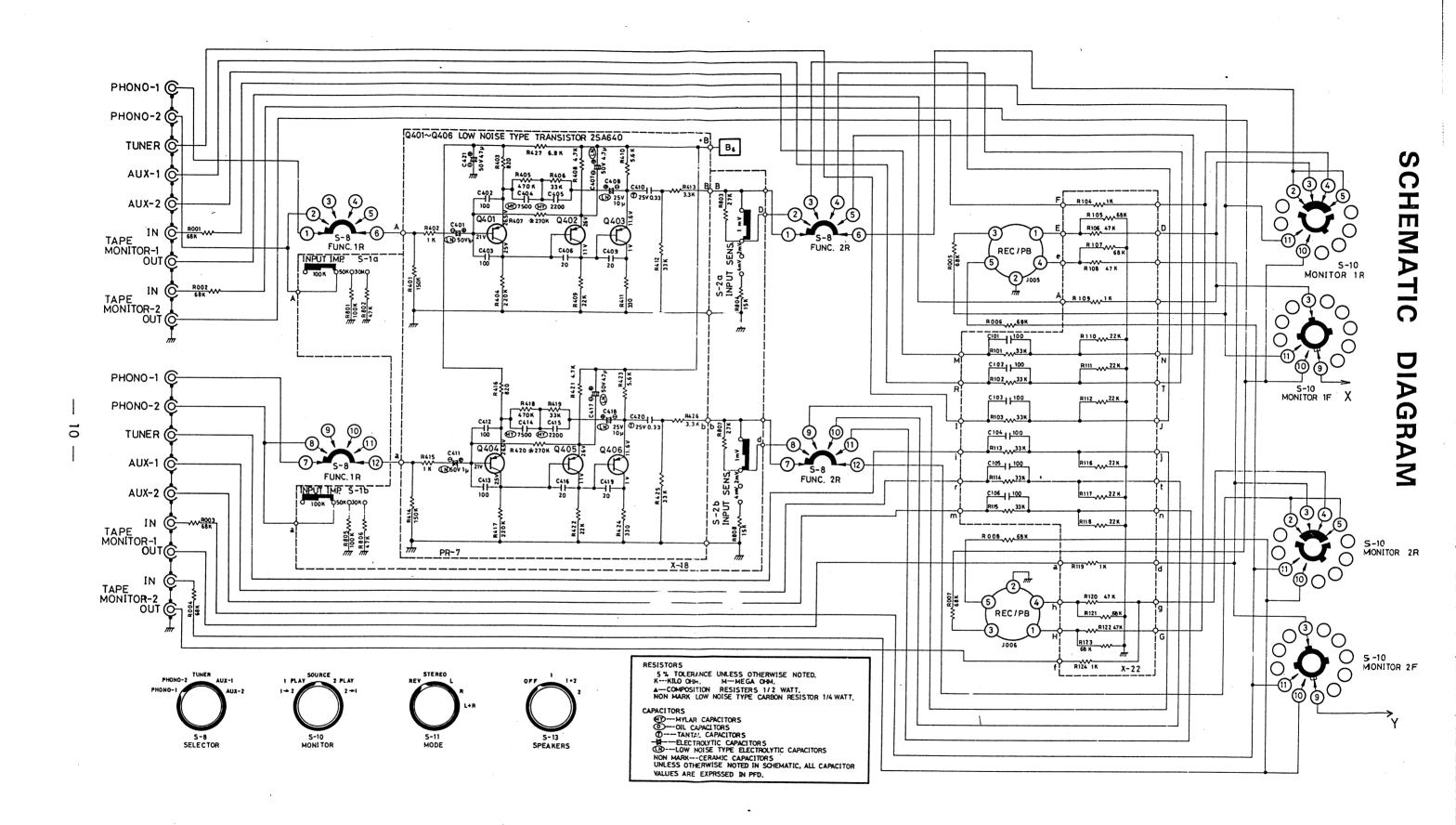
_ 8 _

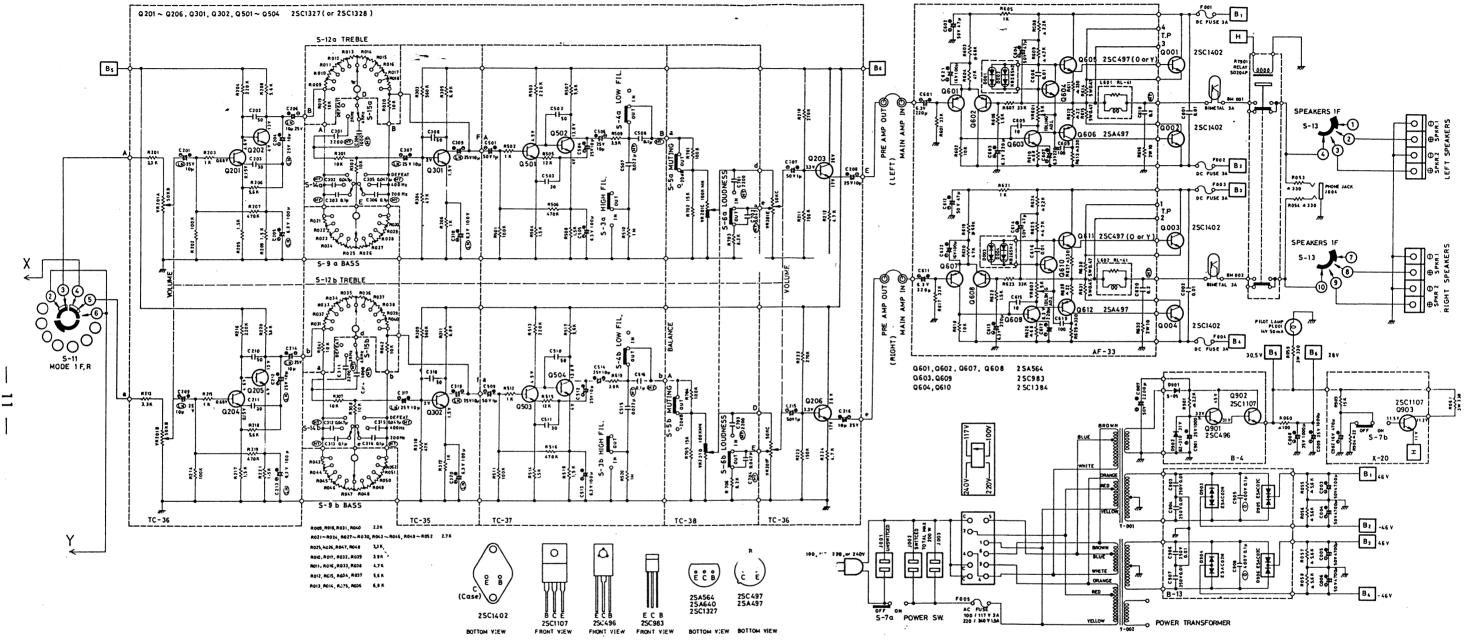
RECTIFIER CIRCUIT BOARD DIAGRAM



RELAY CIRCUIT BOARD DIAGRAM







ADDENDUM

ADDENDUM: CHANGES

The following changes have been made on the Main Amplifier Circuit Board concerns from the production units of Serial No. E 67611 and F 012161 and on.

- Bracket, Main Amp PCB changed from type CR6 (Part No. 648211117) to type CR4 (Part No. 648211120).
 DIFFERENCE: The new type has the insert portion slightly shorter than the old type.
- MAIN Amp PCB changed from the board type "AF-33C" (Part No. 140600651) to the type "AF-33D" (Part No. 140600655).

REASON: In accordance to the change incorporated as the item 1 above.

NOTE: Main Amp PCB w/components is also changed from Part No. 141610231 to Part No. 141610240 accordingly to the change of the Printed Circuit Boards.

CAUTION: Do not use the new Main Amp PCB "AF-33D" on the old type Bracket, as the electrical connections may become unstable causing damages to transistors and other parts.

PARTS LIST

CHASSIS PARTS

| Schematic Location | Part No. | Description |
|--|-----------|---|
| | 116310061 | Knob, Tone Turn-over switch |
| | | Knob, Balance Control |
| | | Knob, Volume Control |
| | 116210009 | Knob, Push Switch, Power, Muting, etc. |
| | 116320062 | |
| S7 | 614010103 | |
| S8 | 601011239 | Switch, Func. Selector |
| S9, 12 | 601011238 | Switch, Treble and Bass |
| S10 | 601011227 | Switch, Monitor |
| S11 | 601011240 | Switch, Mode |
| S13 | 601011225 | Switch, Speakers |
| | 648211116 | AC Outlet |
| J004 | 626110022 | Jack, Headphones |
| J005,006 | 625001112 | Pin Jack, 5P |
| | 624100104 | Pin Jack, 4P, RCA Type |
| | 624100208 | |
| | 624100210 | Pin Jack, 10P, RCA Type |
| | 642400104 | |
| | 648211114 | Bracket, AC Fuse |
| | 648211117 | Bracket, Main Amp. PCB |
| | 648211118 | Socket, Power Transistor |
| | 648211119 | Bracket, DC Fuse |
| | 351140005 | Lamp, 14V 50mA |
| BM001,002 | 330111011 | Circuit Breaker |
| Q001,002, Q003,004 | 301201139 | Transistor, 2SC1402, Power Amp. |
| D001,002, D003,004 | 300212002 | Varistor, KB-265 |
| T001,002 | 205001329 | Transformer, Power Supply "C type" |
| F001,002,003, F004,005 | 341220030 | Fuse, 3A-3AG, DC and (AC 117V) Circuit |
| - | RESISTOR | RS |
| R001,002,003, R004,005,006, R007,008 | 1 | Carbon Film, 68K ±5%, 1/4W |

| Schematic Location | Part No. | Description |
|---|-------------|------------------------------|
| R009,018, } R031,040 | 552022222 | Carbon Film, 2.2K ±5%, 1/4W |
| R010,017, R032,039 | 552039222 | Carbon Film, 3.9K ±5%, 1/4W |
| R001,016, | 552047222 | Carbon Film, 4.7K ±5%, 1/4W |
| R012,015, R034,037 | 552056222 | Carbon Film, 5.6K ±5%, 1/4W |
| R013,014,} R035,036 | 552068222 | Carbon Film, 6.8K ±5%, 1/4W |
| R019,020, R041,042 | 552010322 | Carbon Film, 10K ±5%, 1/4W |
| R021,022,023, R024,027,028, R029,030,043, R044,045,046, R049,050,051, R052 | - 552027222 | Carbon Film, 2.7K ±5%, 1/4W |
| R025,026, | 552033222 | Carbon Film, 3.3K ±5%, 1/4W |
| R053,054 | 551033133 | Composition, 330 ±10%, 1/2W |
| R055,056, | 551056233 | Composition, 5.6K ±10%, 1/2W |
| R059,061 | 553133163 | Metal Oxide, 330 ±10%, 3W |
| R060 | 551010133 | Composition, 100 ±10%, 1/2W |
| | CAPACITO | ORS |
| C001,002 | 440100985 | Ceramic, 0.01 mfd, 250V |
| C003,004, } C005,006 | 400400449 | Electrolytic, 4700 mfd, 50V |
| C007 | 400220449 | Electrolytic, 2200 mfd, 50V |
| C008,009 | 402100439 | Electrolytic, 1000 mfd, 35V |
| | | , |
| | | |
| 1 | | |

AUX INPUT DIVIDING CIRCUIT BOARD

| Schematic Location | Part No. | Description |
|-------------------------------|-----------|----------------------------|
| | RESISTOR | S |
| R101,102,103, R113,114,115 | 552033322 | Carbon Film, 33K ±5%, 1/4W |
| R104,109, R119,124 | 552010222 | Carbon Film, 1K ±5%, 1/4W |
| R105,107, R121,123 | 552068322 | Carbon Film, 68K ±5%, 1/4W |
| R106,108, } | 552047322 | Carbon Film, 47K ±5%, 1/4W |

| Schematic Location | Part No. | Description |
|------------------------------|------------|----------------------------------|
| R110,111,112 R116,117,118 | 1552022322 | Carbon Film, 22K ±5%, 1/4W |
| | CAPACITO | DRS |
| C101,102,103 | 7440101103 | Ceramic, 100pF ±10%, 250V |
| | 140800147 | Printed Circuit Board "X-22" |
| | 141810149 | AUX Input Circuit Board Assembly |

PRE-AMPLIFIER CIRCUIT BOARD

| Schematic Location | Part No. | Description |
|-----------------------|-----------|---------------------------------|
| | RESISTOR | S |
| R201,213 | 552033222 | Carbon Film, 3.3K ±5%, 1/4W |
| R202,214 | 552010422 | Carbon Film, 100K ±5%, 1/4W |
| R203,215 | 552010222 | Carbon Film, 1K ±5%, 1/4W |
| R204,216 | 552022422 | Carbon Film, 220K ±5%, 1/4W |
| R205,209 \ | 552015222 | Carbon Film, 1.5K ±5%, 1/4W |
| R217,221 | 992019222 | |
| R206,208, R218,220 | 552056222 | Carbon Film, 5.6K ±5%, 1/4W |
| R207, 219 | 552047422 | Carbon Film, 470K ±5%, 1/4W |
| R210,222 | 552027422 | Carbon Film, 270K ±5%, 1/4W |
| R211,223 | 552015422 | Carbon Film, 150K ±5%, 1/4W |
| R212,224 | 552047222 | Carbon Film, 4.7K ±5%, 1/4W |
| VR201 | 525121118 | Variable, Vol. and Bal. Control |
| | | (100 kmn. 50k Bx2,50kcx2) |

| Schematic | | • |
|--------------------------------|-----------|---|
| Location | Part No. | Description |
| | CAPACITO | ORS |
| C201,204,206, | 412100720 | Electrolytic, 10 mfd, 25V (low noise) |
| C209,212,214 5 | 412100725 | Electronytic, to mia, 25 v (lott motor) |
| C202,210 | 440501283 | Ceramic, 50pF ±10%, 250V |
| C203,211 | 440301283 | Ceramic, 30pF ±10%, 250V |
| C205,213 | 412100509 | Electrolytic, 100 mfd, 6.3V |
| C207,215 | 402100749 | Electrolytic, 1 mfd, 50V |
| C208,216 | 402100629 | Electrolytic, 10 mfd, 25V |
| | TRANSIST | rors |
| Q201,202,203,\ Q204,205,206 | 301201134 | 2SC1327 |
| | 140700735 | Printed Circuit Board "TC-36" |
| | 141710227 | Pre-amp. Circuit Board Assembly |

TONE AMPLIFIER CIRCUIT BOARD

| Schematic | | |
|--------------------------|-----------|---------------------------------|
| Location | Part No. | Description |
| | RESISTOF | as . |
| R301,302, R307,308 | 552010322 | Carbon Film, 10K ±5%, 1/4W |
| R303,309 | 552056422 | Carbon Film, 560K ±5%, 1/4W |
| R304,310 | 552047322 | Carbon Film, 47K ±5%, 1/4W |
| R305,311 | 552068222 | Carbon Film, 6.8K ±5%, 1/4W |
| R306,312 | 552010222 | Carbon Film, 1K ±5%, 1/4W |
| | CAPACITO | ORS |
| C301,311 | 452221032 | Mylar Film, 0.0022 mfd ±5%, 50V |
| C302,305, C312,315 | 452470932 | Mylar Film, 0.047 mfd ±5%, 50V |
| C303,306, *) C313,316 | 452100932 | Mylar Film, 0.1 mfd ±5%, 50V |
| C304,314 | 452101032 | Mylar Film, 0.001 mfd ±5%, 50V |

| Schematic Location | Part No. | Description |
|-----------------------|-----------|---|
| C307,309, C317,319 | 412100629 | Electrolytic, 10 mfd, 25V (low noise) |
| C308,318 | 440501283 | Ceramic, 50pF ±10%, 250V |
| C310,320 | 412100509 | Electrolytic, 100 mfd, 6.3V (low noise) |
| | TRANSIST | OR |
| Q301,302 | 301201134 | 2SC1327 |
| | SWITCHES | 3 |
| S14 | 611001627 | Bass Turn-over, Roll-off |
| S15 | 611001626 | Treble Turn-over, Roll-off |
| | 140700737 | |
| | 141710229 | Tone Amp. Circuit Board Assembly |
| 1 | | |

EQUALIZER AMP. CIRCUIT BOARD

| Schematic | - | |
|-----------------------|-----------|-----------------------------|
| Location | Part No. | Description |
| | RESISTOR | RS |
| R401,414 | 552015422 | Carbon Film, 150K ±5%, 1/4W |
| R402,415 | 552010222 | Carbon Film, 1K ±5%, 1/4W |
| R403,416 | 552082122 | Carbon Film, 820 ±5%, 1/4W |
| R404, 417 | 552022422 | Carbon Film, 220K ±5%, 1/4W |
| R405,418 | 552047422 | Carbon Film, 470K ±5%, 1/4W |
| R406,412,) | 552033322 | Corbon Eilm 22K 15W 4/4W |
| R419,425 [∫] | 552055522 | Carbon Film, 33K ±5%, 1/4W |
| R407,420 | 552027422 | Carbon Film, 270K ±5%, 1/4W |
| R408,421 | 552047222 | Carbon Film, 4.7K ±5%, 1/4W |
| R409, 422 | 552022322 | Carbon Film, 22K ±5%, 1/4W |
| R410,423 | 552056222 | Carbon Film, 5.6K ±5%, 1/4W |
| R411,424 | 552033122 | Carbon Film, 330 ±5%, 1/4W |
| R413,426 | 552033222 | Carbon Film, 3.3K ±5%, 1/4W |
| R427 | 552068222 | Carbon Film, 6.8K ±5%, 1/4W |
| | CAPACITO | ORS |
| C401,411 | 412100749 | Electrolytic, 1 mfd, 50V |

| Schematic Location | Part No. | Description |
|------------------------------|-------------|----------------------------------|
| C402,403,) | | Description |
| C412,413 | 440101183 | Ceramic, 100 pF ±10%, 250V |
| C404,414 | 452751032 | Mylar Film, 7500 pF ±5%, 50V |
| C405,415 | 452221032 | Mylar Film, 2200 pF ±5%, 50V |
| C406,409,) | | |
| C416,419 | 440201283 | Ceramic, 20 pF ±10%, 250V |
| C407,417 | 412470749 | Electrolytic, 4.7 mfd, 50V |
| C408,418 | 412100629 | Electrolytic, 10 mfd, 25V |
| C410,420 | 444330943 | Tantalum, 0.33 mfd ±10%, 35V |
| | TRANSIST | ORS |
| Q401,402,403 Q404,405,406 | → 301001120 | 2SA640 |
| | 140500525 | Printed Circuit Board "PR-7" |
| | 141510125 | Equalizer Circuit Board Assembly |

FILTER SWITCH CIRCUIT BOARD

| Schematic | | |
|-------------|-----------|-------------------------------|
| Location | Part No. | Description |
| | RESISTOR | RS |
| R501,522 | 552010422 | Carbon Film, 100K ±5%, 1/4W |
| R502,512 | 552010222 | Carbon Film, 1K ±5%, 1/4W |
| R503,513 | 552022422 | Carbon Film, 220K ±5%, 1/4W |
| R504,508, \ | 552015222 | Contrar Film 4 FIG 1500 44444 |
| R514,518 | 552015222 | Carbon Film, 1.5K ±5%, 1/4W |
| R505,515 | 552012322 | Carbon Film, 12K ±5%, 1/4W |
| R506,516 | 552047422 | Carbon Film, 470K ±5%, 1/4W |
| R507,517 | 552056222 | Carbon Film, 5.6K ±5%, 1/4W |
| R509,519 | 552039222 | Carbon Film, 3.9K ±5%, 1/4W |
| R510,520 | 552010522 | Carbon Film, 1M ±5%, 1/4W |
| | CAPACITO | DRS |
| C501,509 | 402100749 | Electrolytic, 1 mfd, 50V |
| C502,510 | 440501283 | Ceramic, 50 pF ±10%, 250V |

| Schematic Location | Part No. | Description |
|-------------------------|-----------|--------------------------------------|
| C503,511 | 440301283 | Ceramic, 30 pF ±10%, 250V |
| C504,506, } C512,514 | 402100629 | Electrolytic, 10 mfd, 25V |
| C505,513 | 402100509 | Electrolytic, 100 mfd, 6.3V |
| C507,515 | 452220932 | Mylar Film, 0.022mfd ±5%, 50V |
| C508,516 | 452100832 | Mylar Film, 0.1 mfd ±5%, 50V |
| | TRANSIST | ORS |
| Q501,502, Q503,504 | 301201134 | 2SC1327 |
| S3,4 | 614020402 | Switch, High and Low Filter |
| | 140700734 | Printed Circuit Board "TC-37" |
| | 141710226 | Filter Switch Circuit Board Assembly |

MAIN AMPLIFIER CIRCUIT BOARD

| Schematic Location | Part No. | Description | |
|-----------------------|-----------|------------------------------|--|
| | RESISTORS | | |
| R601,607, } | 552033322 | 2 Carbon Film, 33K ±5%, 1/4W | |
| R602, 618 | 552010322 | Carbon Film, 10K ±5%, 1/4W | |
| R603,619 | 552068322 | Carbon Film, 68K ±5%, 1/4W | |

| Schematic Location | Part No. | Description |
|-----------------------|-----------|------------------------------|
| R604,620 | 552047322 | Carbon Film, 47K ±5%, 1/4W |
| R605,621 | | Carbon Film, 1K ±5%, 1/4W |
| R606,622 | 552015222 | Carbon Film, 1.5K ±5%, 1/4W |
| R607,624 | 551022233 | Composition, 2.2K ±10%, 1/2W |
| R609,625 | 551047233 | Composition, 4.7K ±10%, 1/2W |
| R610,626 | 551068033 | Composition, 68 ±10%, 1/2W |

| Schematic Location | Part No. | Description |
|-------------------------------|-----------|-------------------------------|
| R611,613, R627,629 | 551033133 | Composition, 330 ±10%, 1/2W |
| R612,628 | 551022033 | Composition, 22 ±10%, 1/2W |
| R614,615, } R630,631 | 554147973 | MPR, Cement, 0.47 ±10%, 5W |
| R616,632 | 554010053 | Bath-tub, 10 ±10%, 2W |
| | CAPACITO | DRS |
| C601,603,607, C611,613,617 | 402220509 | Electrolytic, 220 mfd, 6.3V |
| C602,604, C612,614 | 402470649 | Electrolytic, 47 mfd, 50V |
| C605,615 | 440101283 | Ceramic, 10 pF ±10%, 250V |
| C606,616 | 440100985 | Ceramic, 0.01 mfd, 250V |
| C608,618 | | Not Used |
| C609,619 | 440101183 | Ceramic, 100 pF ±10%, 250V |
| C610,620 | 450200833 | Mylar Film, 0.2 mfd ±10%, 50V |
| C621,622 | 402100519 | Electrolytic, 100 mfd, 16V |

| Schematic Location | Part No. | Description |
|-----------------------|-----------|--|
| | COIL | |
| L601,602 | 220401120 | Anti-parasitic |
| | TRANSIS | TORS |
| Q601,602, Q607,608 | 301001116 | 2SA564 |
| Q603,609 | 301201140 | 2SC983 |
| Q605,611 | 301201119 | 2SC497 |
| Q606,612 | 301001116 | 2SA497 |
| Q604,610 | 301201132 | 2SC1384 |
| | POTENTIO | OMETERS |
| VR601,602 | 510502121 | 5K, Idling Current Adj. |
| | 127012128 | Heat Sink, for Pre-driver, Q603,609 |
| | 127012127 | Heat Sink, for Driver, Q605,606,611,612. |
| | 140600651 | Printed Circuit Board "AF-33" |
| | 141610231 | Main Amp. Circuit Board Assembly |

LOUDNESS CIRCUIT BOARD

| Schematic | | |
|-----------|-----------|---------------------------------|
| Location | Part No. | Description |
| | RESISTOR | RS |
| R701,704 | 552010422 | Carbon Film, 100K ±5%, 1/4W |
| R702,705 | 552015322 | Carbon Film, 15K ±5%, 1/4W |
| R703,706 | 552082222 | Carbon Film, 8.2K ±5%, 1/4W |
| | CAPACITO | DRS |
| C701,703 | 452221032 | Mylar Film, 0.0022 mfd ±5%, 50V |

| Location | Part No. | Description |
|----------|-----------|---------------------------------|
| C702,704 | 452470932 | Mylar Film, 0.047 mfd ±5%, 50V |
| \$5, 6 | 614020402 | Switch, Muting and Loudness |
| | 140700736 | Printed Circuit Board "TC-38" |
| | 141710229 | Loudness Circuit Board Assembly |

PHONO SWITCH CIRCUIT BOARD

| Schematic Location | Part No. | Description |
|-----------------------|-----------|-----------------------------|
| | RESISTOF | RS |
| R801,805 | 552010422 | Carbon Film, 100K ±5%, 1/4W |
| R802,806 | 552047322 | Carbon Film, 47K ±5%, 1/4W |
| R803,807 | 552027322 | Carbon Film, 27K ±5%, 1/4W |
| R804,808 | 552015322 | Carbon Film, 15K ±5%, 1/4W |

| Schematic Location | Part No. | Description |
|-----------------------|-----------|--|
| | SWITCHES | S |
| \$1, 2 | | Phono Input Imp. and Input Sens. Selector |
| | 140800148 | Printed Circuit Board "X-18" |
| | 141810150 | Phono Switch Circuit Board Assembly |

STABILIZER CIRCUIT BOARD

| Schematic Location | Part No. | Description |
|-----------------------|-----------|------------------------------|
| | RESISTOR | |
| R901 | 551022233 | Composition, 2.2K ±10%, 1/2W |
| | CAPACITO | OR . |
| C901 | 402100439 | Electrolytic, 1000 mfd, 35V |
| | TRANSIST | TORS |
| Q901 | 301201131 | 2SC496 |

| Schematic Location | Part No. | Description |
|-----------------------|-----------|-----------------------------------|
| Q902 | 301201133 | 2SC1107 |
| | DIODES | |
| D901 | 300919008 | S-05, Rectifier |
| D902 | | BZ-310, Zener |
| | 140800146 | Printed Circuit Board "B-4" |
| • | 141810148 | Stabilizer Circuit Board Assembly |

RELAY CIRCUIT BOARD

| Schematic Location | Part No. | Description |
|-----------------------|-----------|--|
| | RESISTO | RS |
| R903 R904 | | Carbon Film, 15K ±5%, 1/4W Composition, 22 ±10%, 1/2W |
| | CAPACITO | OR . |
| C902 | 402470516 | Electrolytic, 470 mfd, 16V |

| Schematic Location | Part No. | Description |
|-----------------------|-----------|------------------------------|
| | TRANSIST | |
| Q903 | 301201133 | 2SC1107 |
| RY901 | 240111221 | Relay |
| | 140800142 | Printed Circuit Board "X-20" |
| | | Relay Circuit Board Assembly |

RECTIFIER CIRCUIT BOARD

| Schematic | | | |
|----------------------|-----------|-------------------------|--|
| Location | Part No. | Description | |
| • | CAPACITO | ORS | |
| C903,904 C906,907 | 440100985 | Ceramic, 0.01 mfd, 250V | |
| C905,908 | 431100894 | Oil, 0.1 mfd ±20%, 400V | |
| | DIODES | | |
| D903,904 | 300919010 | ESACO2-N, Rectifier | |

| Schematic -ocation | Part No. | Description |
|-----------------------|-----------|----------------------------------|
| D905,906 | 300919009 | ESACO2-C, Rectifier |
| | 140800145 | Printed Circuit Board "B-13" |
| | 141810145 | Rectifier Circuit Board Assembly |

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